MUSUM 19 ASTR

(Not shown: hourly communications costs, which are paid by the user.)

SUCCESSIVE GENERATIONS OF THE XANADU SYSTEM

The current version of the system is indicated. Aspects that have been designed but not yet implemented are marked with asterisks. Two and three asterisks indicate later stages. (Quotes mean no additional implementation will be required.)

	1 Dimension (text)	2 Dimensions (pixel graphics)	3 Dimensions (object models)
DOCUMENTS	CURRENT	**	***
VERSIONING (differences, commonalities, historical backtrack)	CURREMT	**	***
COLLAGING (Windowing, collaging, anthologies)	CURRENT	**	***
TWO-WAY LINKS (any number of types)	CURRENT	"	"
FAST BACKTRACK	*	**	***
MULTIWAY LINKS (any number of types)	*	"	"
SECURITY/PRIVACY	*	"	"
PUBLISHING	*	"	"
ROYALTY	*	"	"
NETWORKING	*	"	"

The two-dimensional storage will permit scrolling and zooming in large bit-map pictures (such as Landsat images) while the pictures are continuously displayed.

The three-dimensional storage will permit three-dimensional objects to be modelled by various mathematical methods, combined in a master scene, and (if desired) ray-trced within the data-search algorithm.

SOME SLIGHTLY TECHNICAL BUSINESS-ORIENTED NOTES.

(Hypothetical)

1990 PROFIT-AND LOSS STATEMENT FOR SMALL XANADU STAND (city of one million--
by the year 2000, a stand of this size should be right for a town of 25,000)

INCOME
======

CONNECT & DELIVERY CHARGES Basis: 50 lines av. $4/hr, 24 hrs/day w $5k/day	1,800,000
WORKSTATION RENTALS IN STAND Basis: rental $500/day (av. 10 units/10 hrs)	180,000
STORAGE FEES Basis: 2000 meg @ 75/yr	150,000
PRINTOUT CHARGES Basis: 1,000,000 pages @ .25	250,000
FOOD SERVICES	25,000
OTHER SALES (workstations, souvenirs, books)	500,000
TOTAL IN (approx)	about $ 3,000,000

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COSTS OF OPERATION

Buildings & grounds (pro-rata deprec.)	$250,000
EQUIPMENT (lease costs)	200,000
MAINTENANCE	75,000
PROGRAM & PROGRAM MAINTENANCE (a percentage of hourly revenues & storage)	180,000
TELEPHONE LINES	75,000
STEWARD SALARIES	200,000
WATER, ELECTRICITY, etc.	160,000
FOODSTUFFS AND SUPPLIES	150,000
TOTAL OUT (approx)	about $ 1,500,000

HISTORICAL PRECEDEENTS

The Xerox Corporation was (originally called Haloid) spent over a decade working on the fast-copy process, even though market research during this period indicated that there would be NO demand for such a product. Sales of the first Xerox copiers outstripped all 20-year market-research projections in the first six months. Still, in the first five years of the Xerox machine, every company and every university had nervous meetings about whether usage could possibly justify a copying machine. After installation, usage in each place was always astronomical compared to all predictions.

Exactly the same findings have occurred for computer usage. The demand for information services of every kind, ONCE THEY BECOME EASY AND CHEAP, usually astonishes most people.

We believe that our service will have a similar impact, and that the amount of storage people will want-- individuals as well as companies-- will be astronomical.

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SUMMARY

We believe that ALL TEXT, ARCHIVING AND ELECTRONIC PUBLISHING PROBLEMS MUST BE SOLVED AS A WHOLE; and that we have in principle done so in a unique and feasible fashion.

We believe we have the unique key to electronic publishing, teaching by computer, tomorrow's literature and the electronic archive of the future. Others have missed it because they have concentrated too much on irrelevant technical issues, such as moment-to-moment changes in available hardware. It is a system of storage for text and graphics intended as a universal and high-performance storage and delivery service to computer screens everywhere.

Tomorrow's system for the storage and delivery of text must do more than old-fashioned print on paper, yet be as easy for beginners. Such a system must solve the problems of copyright, making it easy and proper to quote from any written work into any other, but giving fair, precise and proportional reward to publishers and authors.

It must be quick.

It must be cheap.

Finally, it must be universal.

We foresee a vast utility-- a system of storage and delivery for text and graphics-- distributed on computers throughout the United States and later the world, using both satellites and ground-based communication mechanisms.

Our business plan is a complete package for going from a small enterprise to the world-wide network, proposing a style of growth and financing to be patterned after one of America's most successful institutions.

Documents can have any structure, plus WINDOWS or LINKS to any other available documents.

WINDOWS are quotations of any size from one document to another.

LINKS are connections, put in by authors and readers, between part of one document and part of another. Links may be of many types, including marginal notes, commentaries, resemblances to be pointed out.

THE XANADU PUBLISHING METHOD

The copyright laws do not need to be changed, as some have thought. However, we will offer with this system of storage a set of contractual arrangements. A published document accumulates royalties for EVERY BYTE SENT OUT TO ANY USER, these royalties coming out of the user's connect and shipment charges. Thus ANY DOCUMENT MAY FREELY QUOTE ANY OTHER, SINCE THE QUOTED MATERIAL ACCUMULATES ROYALTIES TO THE DOCUMENT OF ORIGIN. This is perfectly fair, prevents misquotation, and is implementable. This "subroyalty" proposal is, we feel, a unique and total solution to the copyright problem. (It is discussed more fully elsewhere.)

The Xanadu company (or companies) is not and cannot be a publisher. There are too many unknowns and possible liabilities. Rather, anyone who chooses to make a document publicly available-- in full awareness of such problems as libel, potential copyright violation, national security, etc.-- is a publisher. We presume that publishers will be both publishing companies and individuals, just as with paper publishing.

Thus we refer to the Xanadu publishing METHOD, which is open to all users of the system. The simplest analogy: WE ARE THE PRINTING PRESS, others (firms and individuals) are the publishers.

THE XANADU(tm) STANDS

It is vital that people think of the Xanadu system as friendly, accessible, and usable for any purpose. It is also important for them to be concerned about its safety and freedom. (And, of course, it is also important to build this large distributed system as fast as possible, without having to raise more capital than necessary.)

For this reason we want to build on the McDonald's model: a colorful, visible station in every community-- the Xanadu stand. To start your account, drive up to the Xanadu stand and walk in. To learn how to use it, visit the Xanadu stand, where friendly, costumed attendants will help you get started, and different computers may be rented to get the feel of what you want.

Most important, dial in to your local stand to connect to the whole system.

Franchising, as in the McDonald's chain, will allow each stand to be locally financed, so we need centralize only research, development and training.

As the term is currently used, electronic mail is any system where a message is sent between users by a chain of computers. The message is held at the last computer until the user "takes it out," or until it has been placed in a file area he has designated.

The right way to do it, we believe, is to have the storage system hold the correspondence for the user indefinitely, if he chooses to pay the storage costs. Thus the user need have no concern with space management.

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WHO PAYS?

This is not to be a charity operation. Some customer must pay for the storage of every byte that is stored, the transmission of every byte that is sent out.

HOW BIG CAN IT GROW?

THERE IS NO LIMIT ON THE SIZE OF THE NETWORK OR THE AMOUNT OF MATERIAL. (In fact making sure of this has been the principal technical hurdle.) Our secret (and probably patentable) methods will keep it fast as it grows worldwide.

WHERE WILL IT ALL BE STORED?

Not in a single location; that would be both too vulnerable and too uneconomical. Moreover, the dangers of centralization are well known.

We propose a system of distributed stations everywhere, starting with the United States (see below).

DOES IT USE VIDEODISCS?

Different gadgets get special publicity in different years. Right now everyone is bonkers about videodiscs. Videodiscs are JUST ANOTHER FORM OF STORAGE. Storage wil continue to improve-- faster, cheaper, more reliable-- for a very long time to come. This year it's videodiscs. In five years it will be holograms. In ten years it may be single-atom capture. The Xanadu system is designed to work with all forms of storage, optimizing for price-performance at a given time.

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THE NEW FORMS OF LITERATURE

Tomorrow's universal text system must be "literary" in ways that technicians do not recognize, especially allowing marginal notes, links, and collaging of new documents out of old.

We also think that interactive screens will make sequential writing less important. Today's conventional writing may be gradually replaced by non-sequential writing (hypertext), in which the reader make take different directions at will. All this is easy in Xanadu hypertext.

OTHER TEXT SYSTEMS

There are many computer publishing schemes and shared-text systems. So far they are extremely limited. They force the use of particular interactive styles, they force particular screen conventions on the user. There is little concern for archival and long-term uses. However, some comparisons may be helpful.

HOW IT COMPARES WITH--

Videotext: Prestel (U.K.), Teletel (France)

These systems sell individual screenfuls of text and graphics, require the user to deal with intricate addressing, work only with low-grade screens and individual screenfuls of information.

Videotext: Telidon (Canada), NAPLPS (U.S.)

Unlike the English and French systemsl, these are transmission codes--essentially a text-and-picture transmission system.

These transmission codes will be an option with Xanadu feed.

Electronic Bulletin Boards

Electronic bulletin boards, now springing up everywhere, allow computer users to leave all kinds of messages and commentary for one another. Some control is exerted by the "Sysop," or person who runs it. There is nothing systematic about such correspondence: all of it is lost eventually; many random conversations occur there, but there is no way to look for serious discussion. Related remarks cannot be gathered together or published.

Teleconferencing

Teleconferencing is slightly better in some respects: an organized system of conversation, nominally on a specific topic, by people calling in from their computers. Again, it exists in limbo: the contents are temporary and thus shallow; teleconferences cannot be combined.

Publishing via The Source

In recent years, a conventional time-sharing service was set up on a special marketing deal at low prices. It is used principally for the storage of text, though (like most time-sharing) it was not particularly designed for it. Publication arrangements with royalty are now possible, but that simply means that any user can dial in, MUST RECEIVE THE ENTIRE DOCUMENT INTO HIS COMPUTER, and pays a fixed price. This can tie up the phone line for hours and has no particular advantage.

Whereas on the Xanadu system, YOU DON'T HAVE TO BUY WHOLE DOCUMENTS; you may access any sentence, paragraph or chunk anywhere on the network, instantly.

Electronic Mail

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SUMMARY OF THE XANADU(tm) HYPERTEXT SYSTEM AND STORAGE NETWORK

WHAT IS IT?

The Xanadu System is a complete worldwide plan for electronic storage, electronic publishing, private storage services to individuals, and much more.

Specifically, it is a storage management program that rapidly supplies to any user what he requests from an ever-growing collection of text and graphics stored anywhere on a far-flung network of computers. The system is designed to supply SMALL PIECES ON THE INSTANT OF DEMAND, rather than large documents.

It can deliver exactly each small fragment requested by each user almost at the moment it is requested, and yet grow indefinitely. That is the special character of our software.

We believe it will be the foundation of the twenty-first century's universal text utility, as fundamental as the telephone, serving billions of users with a new form of literature.

WHAT STAGE IS IT IN?

The initial program (text only) is currently being debugged. Though in its present stage there is very little to see, it is only a few months from a stable and usable version.

WHAT DOES IT LOOK LIKE?

No particular way; how it looks depends on your screen (workstation) and the viewing and manipulation program that you run on there. These can range from a Kermit the Frog viewing program for the youngest child to a multli-windowed simulation-graphic system for astrophysics or DNA researchers. (The workstation and viewing program we call the user's Front End; the Xanadu system is the storage and feeder service, or Back End.)

We simplify the problem by not trying to control the appearance on the screen or the user's interaction. Thus the Xanadu system is JUST STORAGE-- but storage which by its unusual mechanisms solves a large number of problems.